

# PATENT ABSTRACTS OF JAPAN

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(21)Application number : 09-316203 (71)Applicant : KYORAKU CO LTD  
(22)Date of filing : 31.10.1997 (72)Inventor : KIMURA ISAO

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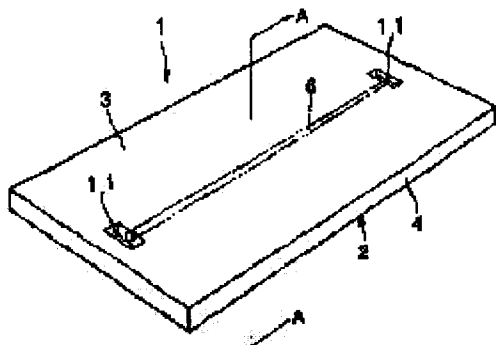
## (54) HOLLOW DOUBLE-WALL STRUCTURE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a hollow double-wall structure wherein a deformation strain does not arise by a cooling contraction after forming even when the strength and the rigidity are improved by the insertion of a pipe.

**SOLUTION:** This hollow double-wall structure 1 is constituted of a face wall 2, a rear wall 3 which is confronted with the face wall 2 with an interval, and a peripheral wall 4 which forms a hollow part between the face wall 2 and the rear wall 3. In the hollow part, a straight pipe 6 is arranged. The periphery of the pipe 6 is surrounded by a surrounding wall which is

integrally connected from the rear wall 3. At regions of the rear wall 3, which correspond with the end parts of the pipe 6, recessed parts 11, 11 which hold a play interval to the end surfaces of the pipe 6 are provided.



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## CLAIMS

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### [Claim(s)]

[Claim 1] It is a hollow double-frame construction object which comprises a front wall, a back wall which sets an interval to a front wall and counters it, and a circumferential wall which forms a centrum between a front wall and a back wall, A hollow double-frame construction object which the circumference of a pipe is surrounded with a surrounding wall which stands in a row in a back wall and one at least, and forms a crevice holding a play interval over the end face of a pipe in a part corresponding to an end of a pipe of a back wall while a straight pipe is allocated in a centrum, and is characterized by things.

[Claim 2] The hollow double-frame construction object according to claim 1 performing a surface treatment which improves slide nature, such as plating, on the surface of a pipe.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Field of the Invention] Blow molding of the thermoplastics is carried out in this invention.

Therefore, it is related with the hollow double-frame construction object acquired.

#### [0002]

[Description of the Prior Art] In the hollow double-frame construction object made from a plastic which constitutes the interior wall of a building, a partition, a door, a headrest, an armrest of a car, etc. from the former, By inserting a curved surface shape rod-like structure to the inner rib formed in a centrum by plate-like, the art which raises intensity and rigidity is indicated to JP,9-155957,A.

#### [0003]

[Problem(s) to be Solved by the Invention] Although these people developed the art indicated to JP,9-155957,A shown above, a subsequent examination mainly showed that there were the following problems on blow molding.

[0004] Namely, in the art indicated to JP,9-155957,A, From the place whose rod-like

structure inserted to the hollow double-frame construction object by which blow molding is carried out is a curved surface shape thing in plate-like, It is that the cooling shrinkage produced in the process which a hollow double-frame construction object cools after blow molding presents the phenomenon selectively barred by the rod-like structure inserted, and the differential shrinkage by this phenomenon causes deformation distortion.

[0005] Then, the purpose of this invention is as follows.

It is going to solve the above technical problems and a straight pipe is allocated in a centrum, The hollow double-frame construction object which is lightweight and has rigidity should be acquired by having established the crevice holding the play interval over the end face of a pipe in the part corresponding to the end of the pipe of the surrounding wall in which a pipe is surrounded, and the back wall which accomplishes one.

The slide nature to the surface of the pipe accompanying contraction of the part which is in contact with the pipe in the process in which a hollow double-frame construction object carries out cooling shrinkage after blow molding is good, And the length of a pipe misses the part which increases relatively in the crevice of a back wall, and acquire the hollow double-frame construction object which does not produce the deformation distortion by the cooling shrinkage after shaping even if it aims at intensity and rigid improvement by inserting a pipe.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, a hollow double-frame construction object concerning this invention was constituted as follows. Namely, a back wall in which the composition sets an interval to a front wall and a front wall, and counters them, It is a hollow double-frame construction object which comprises a circumferential wall which forms a centrum between a front wall and a back wall, While a straight pipe is allocated in a centrum, the circumference of a pipe is surrounded with a surrounding wall which stands in a row in a back wall and one at least, and forms a crevice holding a play interval over the end face of a pipe in a part corresponding to an end of a pipe of a back wall.

[0007] In the above-mentioned composition of this invention, it is preferred to perform a surface treatment which improves slide nature, such as plating, on the surface of a pipe.

[0008] What is necessary is just to have the linearity which does not necessarily bar not a thing of what has the Masanao nature in a strict meaning but the slide nature of

resin to the surface of a pipe with a straight pipe in this invention.

[0009]

[Embodiment of the Invention]Drawing 1 and drawing 2 are the hollow double-frame construction objects concerning the 1 embodiment of this invention, and the perspective view and drawing 2 which looked at drawing 1 from the rear-face side are an A-A line expanded sectional view of drawing 1.

[0010]Drawing 3 is an expanded sectional view of the portion corresponding to drawing 2 concerning other embodiments of this invention.

[0011]The sectional view and drawing 5 in which drawing 4 and drawing 5 show the blow molding mode of the hollow double-frame construction object concerning the 1 embodiment of this invention, drawing 4 makes an attachment component advance, and the state just behind the entrainment of pressurized fluid is shown are a sectional view showing the state where the attachment component was retreated.

[0012]In drawing 1, 1 is a hollow double-frame construction object. This hollow double-frame construction object 1 has constituted panel shape, as a front wall and 3 been circumferential walls and a back wall and 4 shown to drawing 2 in 2 for them, to the front wall 2, the back wall 3 set the interval, and has countered and the centrum 5 is formed between the front wall 2 and the back wall 3 with the circumferential wall 4.

[0013]While the straight pipe 6 is allocated in the centrum 5 of the above-mentioned hollow double-frame construction object 1, the perimeter enclosure is surrounded with the surrounding wall 7 in which the circumference of this pipe 6 stands in a row in the back wall 3 and one, and the portion of the surrounding wall 7 corresponding to the inner surface of the front wall 2 is welded by the front wall 2. 8 is the welding. The portion 9 which stands in a row in the back wall 3 of the surrounding wall 7 has accomplished the heavy-gage part by which the opposing wall of each other which is prolonged from the back wall 3 and stands in a row in the surrounding wall 7 was welded. 10 is the welding.

[0014]As shown in drawing 1, the crevices 11 and 11 holding the play interval over the end face of the pipe 6 are formed in the part corresponding to the end of the pipe 6 of the back wall 3.

[0015]Other embodiments of this invention are shown in drawing 3. In this embodiment, although the surrounding wall 7 of the pipe 6 stands in a row in the back wall 3 and one, the surrounding wall 7 has the composition which is not welded by the front wall 2. Since other composition is the modes and the composition of 1 operation of this invention, it gives a same sign to the part of the composition, and omits explanation.

[0016]Although the cylindrical thing was used as the pipe 6 in the embodiment of the

graphic display, the pipe 6 may not be restricted to this and may be a thing of the shape of a triangular cylinder, or the shape of an elliptic tube, for example. And in the case of a triangular cylinder-like pipe, it is good to turn one top ridge to the back wall 3 side, and to make the flat-surface part between two \*\* counter the front wall 2 side. In the case of an elliptic tube-like pipe, it is good to turn the shorter side side to the back wall 3 and a front wall 2-way.

[0017]The hollow double-frame construction object 1 concerning this invention comprises thermoplastics in which blow molding is possible, such as ABS plastics, modified polyphenylene oxide resin, polycarbonate resin, polyamide resin, polypropylene resin, and polyethylene resin. The pipe 6 is metal, and it shall perform surface treatments, such as plating, in order to improve surface slide nature if needed.

[0018]As shown in drawing 4 and drawing 5, blow molding of the hollow double-frame construction object 1 concerning this invention is carried out. While arranging across the both ends of the pipe 6 between the attachment components 14 of the couple provided in the split metallic mold 13 of another side between one split metallic mold 12 and the split metallic mold 13 of another side, the parison 15 is arranged, and as shown in drawing 4, blow molding of the pressure fluid is blown and carried out the mold closure back and into the parison 15. Subsequently, as shown in drawing 5, the attachment component 14 is retreated. And after blow molding cools the surface of the front wall 2, the back wall 3, and the circumferential wall 4 which constitute the hollow double-frame construction object 1 by cooling of the split metallic molds 12 and 13, waits to carry out cooling solidification and picks out the hollow double-frame construction object 1 from the split metallic molds 12 and 13 to such an extent that shape is held. In drawing 4 and drawing 5, 16 shows a cooling water passage and 17 shows the barricade.

[0019]As mentioned above, in the hollow double-frame construction object 1 by which blow molding was carried out, as the attachment component 14 of a couple shows to the back wall 3 at drawing 1, the crevices 11 and 11 are formed. These crevices 11 and 11 hold the play interval over the end face of the pipe 6 as mentioned above.

[0020]In the hollow double-frame construction object 1 concerning this invention, while the straight pipe 6 is allocated in the centrum 5, the circumference of the pipe 6 is surrounded with the surrounding wall 7 which stands in a row in the back wall 3 and one at least, but. Since the crevices 11 and 11 holding the play interval over the end face of the pipe 6 are established in the part corresponding to the end of the pipe 6 of the back wall 3, Even if the resin which constitutes the hollow double-frame construction object 1 after blow molding carries out cooling shrinkage, Even if the

slide nature to the surrounding wall 7 of the surface of the pipe 6 is good, and the deformation distortion accompanying contraction does not arise to the part of the surrounding wall 7 and also the pipe 6 develops relatively by contraction to the resin which constitutes the hollow double-frame construction object 1, Even if it aims at intensity and rigid improvement when the hollow double-frame construction object 1 inserts the pipe 6 since it is absorbed without affecting others because the part projects in the play interval of the crevices 11 and 11, the deformation distortion by the cooling shrinkage after shaping does not arise.

[0021]

[Effect of the Invention]By having established the crevice holding the play interval over the end face of a pipe in the part corresponding to the end of the pipe of allocating a straight pipe in a centrum, the surrounding wall in which a pipe is surrounded, and the back wall which accomplishes one according to this invention, While it is lightweight and the hollow double-frame construction object which has rigidity is acquired, in the process in which a hollow double-frame construction object carries out cooling shrinkage after blow molding. The slide over the surface of the pipe accompanying contraction of the part which is in contact with the pipe is good, and the hollow double-frame construction object which does not produce the deformation distortion by the cooling shrinkage after shaping even if it aims at intensity and rigid improvement, when the length of a pipe can miss the part which increases relatively in the crevice of a back wall and inserts a pipe is acquired -- things can be carried out.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the perspective view which looked at the hollow double-frame construction object concerning this invention from the rear-face side.

[Drawing 2] It is an A-A line expanded sectional view of drawing 1.

[Drawing 3] It is an expanded sectional view of the portion corresponding to drawing 2 concerning other embodiments of this invention.

[Drawing 4] The blow molding mode of the hollow double-frame construction object concerning the 1 embodiment of this invention is shown, and drawing 4 is a sectional view in which making an attachment component advance and showing the state just behind the entrainment of pressurized fluid.

[Drawing 5] It is a sectional view showing the state where the attachment component was retreated.

### [Description of Notations]

1 Hollow double-frame construction object

2 Front wall

3 Back wall

4 Circumferential wall

5 Centrum

6 Pipe

7 Surrounding wall

8 Welding

9 The portion which stands in a row in the back wall 3 of the surrounding wall 7

10 Welding

11 and 11 Crevice

12 One split metallic mold

13 The split metallic mold of another side

14 The attachment component of a couple

15 Parison

16 Cooling water passage

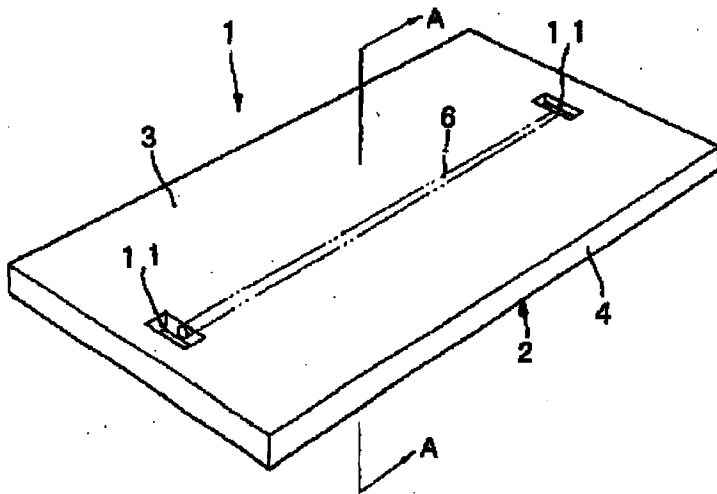
17 Barricade

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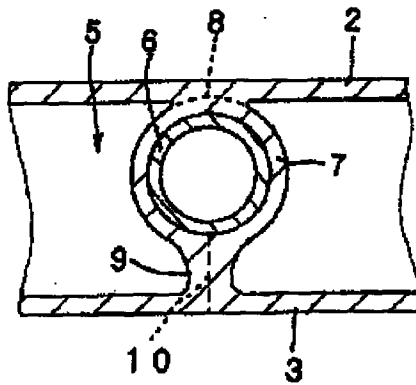
## DRAWINGS

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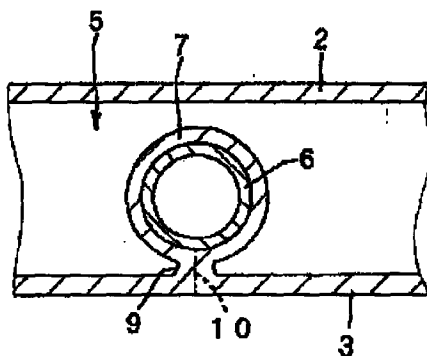
[Drawing 1]



[Drawing 2]

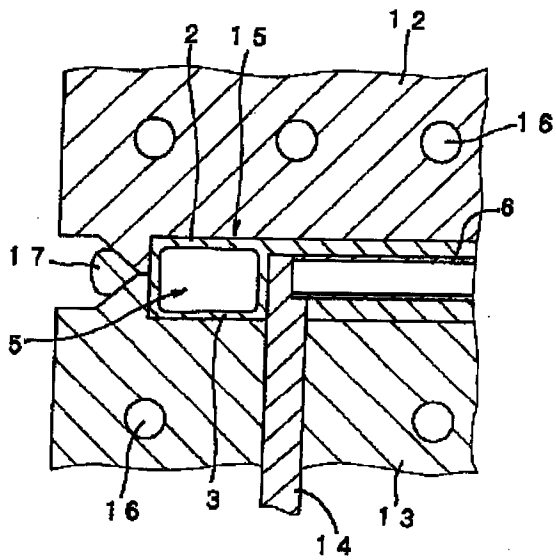


[Drawing 3]

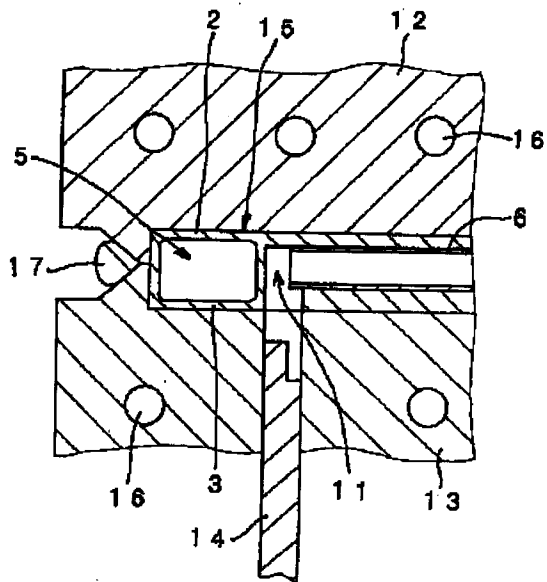




[Drawing 4]



[Drawing 5]



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(71)出願人 000104674

キョーラク株式会社

京都府京都市上京区烏丸通中立売下ル龍前  
町598番地の1

(72)発明者 木村 功

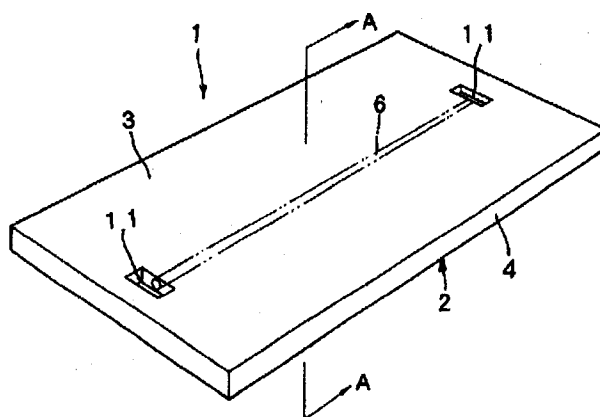
愛知県瀬戸市小金町116-6

(54)【発明の名称】 中空二重壁構造体

(57)【要約】

【課題】 パイプをインサートすることにより強度および剛性の向上を図ったものであっても成形後の冷却収縮による変形歪みを生じない中空二重壁構造体を得る。

【解決手段】 中空二重壁構造体1は、表壁2と、表壁2に間隔をおいて対向する裏壁3と、表壁2および裏壁3との間に中空部を形成する周囲壁4とで構成する。中空部内には真っ直ぐなパイプ6を配設する。パイプ6の周囲は裏壁3と一体に連なる包囲壁で包囲する。裏壁3のパイプ6の端部に対応する部位に、パイプ6の端面に対する遊び間隔を保持する凹部11、11を設ける。



## 【特許請求の範囲】

【請求項 1】 表壁と、表壁に間隔をおいて対向する裏壁と、表壁および裏壁との間に中空部を形成する周囲壁とで構成される中空二重壁構造体であって、中空部内には真っ直ぐなパイプが配設されるとともにパイプの周囲は少なくとも裏壁と一体に連なる包囲壁で包囲されており、裏壁のパイプの端部に対応する部位にはパイプの端面に対する遊び間隔を保持する凹部を形成して成ることを特徴とする中空二重壁構造体。

【請求項 2】 パイプの表面に、メッキなど滑り性を良くする表面処理を施すことを特徴とする請求項 1 記載の中空二重壁構造体。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、熱可塑性プラスチックをブロー成形することにより得られる中空二重壁構造体に関する。

## 【0002】

【従来の技術】従来から、建築物の内装壁、パーティション、扉、あるいは自動車のヘッドレストやアームレストなどを構成するプラスチック製の中空二重壁構造体において、中空部内に形成するインナーリブに平板状かつ曲面状の棒状体をインサートすることにより、強度および剛性を向上させる技術は、特開平 9 - 1 5 5 9 5 7 号公報に記載されている。

## 【0003】

【発明が解決しようとする課題】前掲の特開平 9 - 1 5 5 9 5 7 号公報に記載されている技術は、本出願人が開発したものであるが、その後の検討の結果、主にブロー成形上、次のような問題点のあることが分かった。

【0004】すなわち、特開平 9 - 1 5 5 9 5 7 号公報に記載されている技術においては、ブロー成形される中空二重壁構造体にインサートされる棒状体が平板状かつ曲面状のものであるところから、ブロー成形後に中空二重壁構造体が冷却する過程で生じる冷却収縮が、インサートされている棒状体によって部分的に妨げられる現象を呈し、この現象による収縮差が変形歪みの原因となることである。

【0005】そこで、本発明は、上述のような課題を解決しようとするものであって、中空部内には真っ直ぐなパイプを配設することと、パイプが包囲される包囲壁と一体を成す裏壁のパイプの端部に対応する部位に、パイプの端面に対する遊び間隔を保持する凹部を設けたことにより、軽量で剛性を有する中空二重壁構造体を得られるとともに、ブロー成形後において中空二重壁構造体が冷却収縮する過程で、パイプに接している部位の収縮にともなうパイプの表面に対する滑り性が良くて、しかもパイプの長さが相対的に増大する分を裏壁の凹部において逃がすことができ、パイプをインサートすることにより強度および剛性の向上を図ったものであっても成形後

の冷却収縮による変形歪みを生じない中空二重壁構造体を得ることを目的とするものである。

## 【0006】

【課題を解決するための手段】上記目的を達成するため、本発明に係る中空二重壁構造体は次のように構成した。すなわち、その構成は、表壁と、表壁に間隔をおいて対向する裏壁と、表壁および裏壁との間に中空部を形成する周囲壁とで構成される中空二重壁構造体であって、中空部内には真っ直ぐなパイプが配設されるとともにパイプの周囲は少なくとも裏壁と一体に連なる包囲壁で包囲されており、裏壁のパイプの端部に対応する部位にはパイプの端面に対する遊び間隔を保持する凹部を形成して成ることを特徴とするものである。

【0007】本発明の上記構成においては、パイプの表面に、メッキなど滑り性を良くする表面処理を施すことが好適である。

【0008】なお、本発明において、真っ直ぐなパイプとは、必ずしも厳密な意味での真直性を有するものことではなく、パイプの表面に対する樹脂の滑り性を妨げることのない直線性を有すればよい。

## 【0009】

【発明の実施の形態】図 1 および図 2 は本発明の一実施の形態に係る中空二重壁構造体であって、図 1 は裏面側から見た斜視図、図 2 は図 1 の A - A 線拡大断面図である。

【0010】また、図 3 は本発明の他の実施の形態に係る図 2 に対応する部分の拡大断面図である。

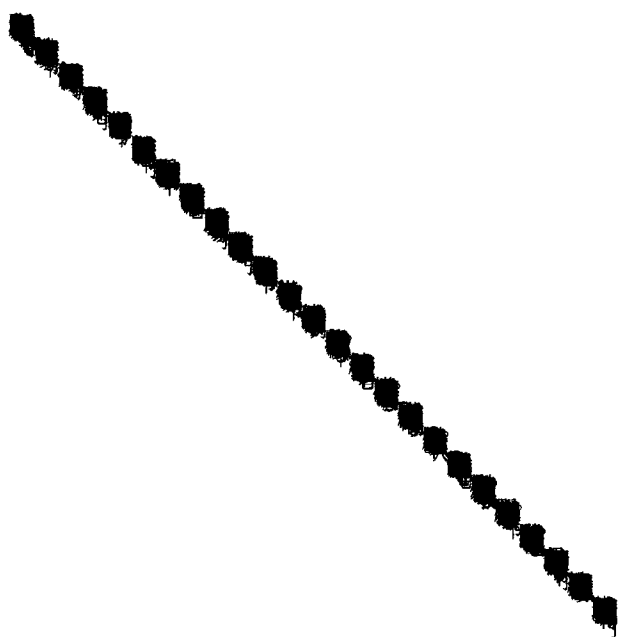
【0011】図 4 および図 5 は本発明の一実施の形態に係る中空二重壁構造体のブロー成形態様を示し、図 4 は保持部材を進出させて加圧流体の吹き込み直後の状態を示す断面図、図 5 は保持部材を後退させた状態を示す断面図である。

【0012】図 1 において、1 は中空二重壁構造体である。この中空二重壁構造体 1 はパネル状を成しており、2 は表壁、3 は裏壁、4 は周囲壁であって、図 2 に示すように、表壁 2 に対して裏壁 3 は間隔をおいて対向しており、周囲壁 4 によって表壁 2 および裏壁 3 との間に中空部 5 が形成されている。

【0013】上記中空二重壁構造体 1 の中空部 5 内には、真っ直ぐなパイプ 6 が配設されるとともに、このパイプ 6 の周囲は裏壁 3 と一体に連なる包囲壁 7 で全周囲が包囲されており、表壁 2 の内面に対応する包囲壁 7 の部分は表壁 2 に溶着されている。8 はその溶着部である。また、包囲壁 7 の裏壁 3 に連なる部分 9 は、裏壁 3 から延びて包囲壁 7 に連なる対向壁が互いに溶着された厚肉部を成している。10 はその溶着部である。

【0014】図 1 に示すように、裏壁 3 のパイプ 6 の端部に対応する部位には、パイプ 6 の端面に対する遊び間隔を保持する凹部 11、11 が形成されている。

【0015】図 3 には、本発明の他の実施の形態が示さ



(39)

